REMARKS

A self-evident grammatical error has been corrected in the specification.

Claims 17, 18, 71, and 72 have been amended to provide that the constant value for the gate-to-body voltage is a non-zero value. This revision is, for example, supported by paragraph 162 of the specification. No claims have been added or canceled. Accordingly, Claims 17 - 88 are still pending.

Claims 17 - 31, 33 - 67, and 69 - 88 have again been rejected under 35 USC 102(e) as anticipated by Litwin et al. ("Litwin"), U.S. Patent 6,100,770. Claims 32 and 68 have again been rejected under 35 USC 103(a) as obvious based on Litwin in view of Misu et al. ("Misu"), Japanese Patent Publication 7-226643. These rejections are respectfully traversed.

The present rejections substantially repeat the prior art rejections presented in the Office Action mailed 17 March 2003 and contain a clear procedural error which was pointed out in the Response submitted 17 June 2003 but which has not been corrected in the present Office Action. The procedural error is that certain dependent claims have been rejected on the basis of narrower art, a single reference, than the art, a combination of references, used to reject the independent claim from which those dependent claims depend.

As is required for a dependent claim, the dependent claims subject to the procedural error all further limit their independent claim. Hence, the art used to reject the dependent claims must be at least as broad as, and cannot (correctly) be narrower than, the art used to reject the independent claim. In the event that this application goes to appeal, it is respectfully requested that the Examiner correct the procedural error in order to simplify the issues for appeal.

In particular, Applicant's Attorney pointed out on page 1 of the June 2003 Response that Claims 33 - 37 and 70 rejected on the basis of Litwin depend from independent Claim 32 rejected on the basis of Litwin and Misu and that, inasmuch as Claims 33 - 37 and 70 all further limit Claim 32, Applicant's Attorney did not understand how Claims 33 - 37 and 70 could be rejected solely on the basis of Litwin. Accordingly, Applicant's Attorney assumed that the Examiner intended to reject Claims 33 - 37 and 70 as obvious based on Litwin and Misu. The rejection of Claims 33 - 37 and 70 solely on the basis of Litwin has, however, been continued in the present Office Action. The prior art rejection of Claims 33 - 37 and 70 is therefore procedurally incorrect and should be rectified.

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Reasons were presented in the Amendment submitted 19 December 2002 as to why Claims 17 - 31, 38 - 67, 69, and 71 - 88 are patentable over Litwin. Those reasons were largely repeated in the June 2003 Response. Nothing in the present Office Action shows why any of those reasons is wrong or why any of Claims 17 - 31, 38 - 67, 69, and 71 - 88 is unpatentable based on Litwin. Accordingly, the present rejection is traversed for substantially the same reasons presented in the December 2002 Amendment and repeated in the June 2003 Response. Since those reasons have already been presented in two communications to the PTO, Applicant's Attorney will not again repeat these reasons. Instead, Applicant's Attorney refers the Examiner to the December 2002 Amendment and June 2003 Response.

Claims 17, 18, 71, and 72 have, as indicated above, been amended. A review of Litwin is helpful in understanding why revisions have been made to these four claims.

Litwin discloses several modes for operating the varactor of Fig. 1. A first operational mode, referred to here as mode 1, is disclosed at col. 5, lines 21 - 58, with respect to the schematic varactor diagram of Fig. 4 corresponding to Fig. 1. In mode 1, a voltage is applied between electrodes C_A and C_B to produce a depletion layer below the gate dielectric layer that underlies gate electrode 16. Electrode C_A is connected to source 13 and drain 14 while electrode C_B is connected to gate electrode 16. Litwin states that the capacitance between electrodes C_A and C_B is the series combination of gate dielectric capacitance C_{OX} and depletion layer capacitance C_D. Adjusting the voltage between electrodes C_A and C_B causes depletion layer capacitance C_D to change so as to change the overall capacitance between electrodes C_A and C_B.

Litwin does not disclose any electrode connection to well 12 in mode 1. Hence, well 12 is presumably floating, i.e., not connected to any external electrode, in mode 1.

A second operational mode, referred to here as mode 2, is disclosed at col. 5, lines 59 - 64. In mode 2, depletion layer capacitance C_D is controlled by applying a suitable variable potential to well 12 while electrodes C_A and C_B are maintained at respective fixed potentials. Again, electrode C_A is connected to source 13 and drain 14 while electrode C_B is connected to gate electrode 16.

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A third operational mode is disclosed at col. 5, lines 64 - 67, where Litwin states that "a fixed potential is applied to one of the electrodes C_A or C_B the other electrode is connected

to the well 12 and the device is controlled by a suitable voltage applied to the well". The third operational mode divides into two sub-modes referred to here as sub-mode 3A and sub-mode 3B. In sub-mode 3A, a fixed potential is applied to electrode C_A connected to source 13 and drain 14, and a variable potential is applied to electrode C_B connected to well 12. In sub-mode 3B, a fixed potential is applied to electrode C_B connected to gate electrode 16, and a variable potential is applied to electrode C_A connected to well 12.

Litwin is unclear as to whether the connection of electrode C_A or C_B to well 12 in the third mode is alternative to, or in addition to, the earlier-identified C_A and C_B connections. In preparing the December 2002 Amendment and June 2003 Response, Applicant's Attorney had concluded that Litwin means the alternative situation. The following connections then occur in sub-mode 3A: electrode C_A is connected to source 13 and drain 14, electrode C_B is connected to well 12, and gate electrode 16 is unconnected. This electrical arrangement is referred to here as mode 3A1. For the alternative situation, sub-mode 3B similarly becomes sub-mode 3B1 in which electrode C_A is connected to well 12, electrode C_B is connected to gate electrode 16, and source 13 and drain 14 are unconnected.

Applicant's Attorney reviewed Litwin with Applicant in the course of preparing this amendment. In that review, Applicant was of the view that Litwin means the additional, rather than alternative, situation. Sub-mode 3A then has the following connections referred to here as mode 3A2: electrode C_A is connected to source 13 and drain 14, and electrode C_B is connected to gate electrode 16 and well 12. Similarly, sub-mode 3B has the following connections referred to here as mode 3B2: electrode C_A is connected to source 13, drain 14, and well 12, and electrode C_B is connected to gate electrode 16. The electrical connections for the six possible operational modes in Litwin are, for convenience, summarized below:

Summary of Litwin's Possible Operational Modes

Mode 1:
a. Source 13 and drain 14 connected to electrode C_A
b. Gate electrode 16 connected to electrode C_B with variable potential applied between electrodes C_A and C_B whereby potential between source 13 and gate electrode 16 is variable
c. Well 12 unconnected

Mode 2:
a. Source 13 and drain 14 connected to electrode C_A at fixed potential
b. Gate electrode 16 connected to electrode C_B at fixed potential
c. Well 12 connected to further electrode at variable potential whereby (a) potential between source 13 and well 12 is variable and (b) potential between gate electrode 16 and well 12 is variable

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Mode 3A1:
a. Source 13 and drain 14 connected to electrode C_A at fixed potential
b. Gate electrode 16 unconnected
c. Well 12 connected to electrode C_B at variable potential whereby potential between source 13 and well 12 is variable

Mode 3A2:
a. Source 13 and drain 14 connected to electrode C_A at fixed potential
b. Gate electrode 16 connected to electrode C_B at variable potential whereby potential between source 13 and gate electrode 16 is variable
c. Well 12 connected to electrode C_B whereby (a) potential between gate electrode 16 and well 12 is zero and (b) potential between source 13 and well 12 is variable and equals potential between source 13 and gate electrode 16

Mode 3B1:
a. Source 13 and drain 14 unconnected
b. Gate electrode 16 connected to electrode C_B at fixed potential
c. Well 12 connected to electrode C_A at variable potential whereby potential between gate electrode 16 and well 12 is variable

Mode 3B2:
a. Source 13 and drain 14 connected to electrode C_A at fixed potential
b. Gate electrode 16 connected to electrode C_B at variable potential whereby potential between source 13 and gate electrode 16 is variable
c. Well 12 connected to electrode C_A whereby (a) potential between source 13 and well 12 is zero and (b) potential between gate electrode 16 and well 12 is variable and equals potential between gate electrode 16 and source 13

Although six operational modes are given here, only four of these modes actually apply to the varactor of Figs. 1 and 4 since Litwin means the two sub-modes of the third operational mode to be either modes 3A1 and 3B1 or modes 3A2 and 3B2. Subject to appropriately adjusting the electrode connections, the varactor of Figs. 1 and 4 of Litwin can then be operated in any of modes 1, 2, 3A1, and 3B1 or in any of modes 1, 2, 3A2, and 3B2 depending on whether Litwin means modes 3A1 and 3B1 or modes 3A2 and 3B2.

Next consider the revisions to independent Claims 17 and 71. As amended here, Claims 17 and 71 respectively recite:

17. A structure comprising a varactor which comprises:

a plate region and body region of a semiconductor body, the body region being of a first conductivity type, the plate region being of a second conductivity type opposite to the first conductivity type, the plate and body regions meeting each other to form a p-n junction;

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a plate electrode and a body electrode respectively connected to the plate and body regions, the plate electrode being at a plate-to-body bias voltage relative to the body electrode;

a dielectric layer situated over the semiconductor body and contacting the body region; and

a gate electrode situated over the dielectric layer at least where the dielectric layer contacts material of the body region, the gate electrode being at a gate-to-body bias voltage relative to the body electrode, the gate-to-body voltage being maintained approximately constant at a non-zero value as the plate-to-body voltage is varied.

71. A method comprising:

providing a varactor which comprises (a) a plate region and a body region of a semiconductor body, (b) a plate electrode and a body electrode respectively connected to the plate and body regions, (c) a dielectric layer situated over the semiconductor body and contacting the body region, and (d) a gate electrode situated over the dielectric layer at least where the dielectric layer contacts material of the body region, the body region being of a first conductivity type, the plate region being of a second conductivity type opposite to the first conductivity type, the plate and body regions meeting each other to form a p-n junction;

applying (a) a plate-to-body bias voltage between the plate and body electrodes and (b) a gate-to-body bias voltage between the gate and body electrodes; and

varying the plate-to-body voltage while maintaining the gate-to-body voltage approximately constant at a non-zero value to cause an inversion layer that meets the plate region to selectively appear and disappear in the body region below the gate electrode.

The potential between (a) gate electrode 16 analogized by the Examiner to the gate electrode of the present claims and (b) well 12 analogized by the Examiner to the body region of the present claims is <u>zero</u> in mode 3A2 of Litwin because gate electrode 16 and well 12 are then both electrically connected to electrode C_B. To the extent that Litwin might mean sub-mode 3A to be mode 3A2 and to the extent that a zero potential between the two electrodes analogized by the Examiner to the gate and body electrodes might be construed as a constant value of the gate-to-body voltage, Claims 17 and 71 have each been amended to recite that the gate-to-body voltage is maintained approximately constant at a <u>non-zero</u> value. Since the gate-to-well potential is <u>zero</u> in mode 3A2, mode 3A2 does <u>not</u> meet the

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requirement of Claims 17 and 71 that the constant value of the gate-to-body voltage <u>differ from zero</u>.

In none of Litwin's other five possible operational modes is the potential between gate electrode 16 and well 12 maintained approximately constant at any value, including "zero". Consequently, the amendment of Claims 17 and 71 to recite that the gate-to-body voltage be maintained approximately constant at a non-zero value distinguishes Claims 17 and 71 from each of Litwin's possible operational modes including mode 3A2 in which the potential between gate electrode 16 and well 12 is zero.

<u>Nothing</u> in Litwin would provide a person skilled in the art with any motivation or incentive for maintaining the potential between gate electrode 16 and well 12 at some constant <u>non-zero</u> value in any of Litwin's operational modes. Claims 17 and 71 are therefore patentable over Litwin.

Subject to revising Claims 17 and 71 to account for the new interpretation of Litwin by the present applicant, all of independent Claims 17, 23, 38, 63, 71, and 79 are patentable over Litwin for the reasons presented in the December 2002 Amendment and June 2003 Response. The Examiner is again referred to those two documents to see these reasons.

Claims 18 - 22, 24 - 31, 39 - 62, 64 - 67, 69, 72 - 78, and 80 - 88 all variously depend from independent Claims 17, 23, 38, 63, 71, and 79. Accordingly, dependent Claims 18 - 22, 24 - 31, 39 - 62, 64 - 67, 69, 72 - 78, and 80 - 88 are variously patentable over Litwin for the same reasons as Claims 17, 23, 38, 63, 71, and 79.

As further pointed out in the December 2003 Amendment and June 2003 Response, Litwin does <u>not</u> disclose the further limitation of any of dependent Claims 18, 20, 29, 39, 40, 43, 53, 61, 67, 69, 72, 73, and 83. Separate grounds are thereby present for allowing Claims 18, 20, 29, 39, 40, 43, 53, 61, 67, 69, 72, 73, and 83 over Litwin.

As to the rejection of Claims 32 and 68 based on Litwin and Misu. Applicant's Attorney has, as mentioned above, again assumed that the Examiner also intended to reject Claims 33 - 37 and 70 on the basis of Litwin and Misu rather than just Claims 32 and 68 since Claims 33 - 37 and 70 all depend from Claim 32. Subject to this assumption, Claims 32 - 37, 68, and 70 are patentable over Litwin and Misu for the reasons presented in the June 2003 Response to which the Examiner is referred.

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As also pointed out in the June 2003 Response, Litwin does not disclose the further limitation of dependent Claim 36 or 70. Consequently, these two dependent claims are separately allowable over Litwin and Misu.

Next, consider the comments presented on pages 3 and 4 of the present Office Action in response to arguments presented in the June 2003 Response for showing the patentability of the present claims.

On page 3 of the Office Action, the Examiner first states that "Applicant argues that Litwin does not appear to control the varactor capacitance with the inversion layer applicant discloses". After further stating that "applicant stats the limitation in claim 17, namely, the gate-to-body voltage be maintained constant as the plate-to-body voltage is varied in [sic, is] not in the reference.", the Examiner alleges "that Litwin implicitly discloses this limitation". Subject to revising each of Claims 17 and 71 to recite that the gate-to-body voltage is maintained approximately constant at a non-zero value, Litwin does not disclose the constancy limitation on the gate-to-body voltage in Claim 17 or 71.

Using the Examiner's analogies, the gate-to-body voltage of Claim 17 or 71 corresponds to the potential between gate electrode 16 and well 12 in Litwin. Referring to the comments presented above about Litwin's operational modes and especially to the Summary of Litwin's Possible Operational Modes, well 12 is unconnected in mode 1. Since a variable potential is applied between source 13 and gate electrode 16 in mode 1, the potential between gate electrode 16 and well 12 is not maintained approximately constant in mode 1. Mode 1 thus does not meet the limitation of Claim 17 or 71 that the gate-to-body voltage be maintained approximately constant at a non-zero value.

A variable potential is applied between gate electrode 16 and well 12 in each of modes 2, 3B1, and 3B2. Hence, none of modes 2, 3B1, and 3B2 meet the limitation of Claim 17 or 71 that the gate-to-body voltage be maintained approximately constant at a non-zero value.

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Gate electrode 16 is unconnected in mode 3A1. Inasmuch as a variable potential is applied between source 13 and well 12 in mode 3A1, mode 3A1 does not meet the limitation of Claim 17 or 71 that the gate-to-body voltage be maintained approximately constant at a non-zero value.

The final possible mode in Litwin is mode 3A2 in which gate electrode 16 and well 12 are electrically shorted to each other (through electrode C_B) so that gate electrode 16 and well 12 are at the same potential. As indicated above, the potential "between" gate electrode 16 and well 12 is thus zero in mode 3A2. Accordingly, mode 3A2 does not meet the limitation of Claim 17 or 71 that the gate-to-body voltage be maintained approximately constant at a non-zero value.

The net result is that no matter how Litwin is reasonably interpreted, none of the modes for operating Litwin's varactors meets the limitation of Claim 17 or 71 that the gate-to-body voltage be maintained approximately constant at a non-zero value. Nor is there anything in Litwin that would provide a person skilled in the art with any motivation or incentive for modifying any of Litwin's varactors so that the potential between the gate electrode and well is maintained approximately constant at a non-zero value. Claims 17 and 71 are thus patentable over Litwin for the previously presented reasons.

Dependent Claim 18, as amended, recites that the claimed structure includes "componentry for maintaining the gate-to-body voltage approximately constant at the non-zero value". Dependent Claim 72, as amended, similarly recites that the claimed method includes "providing componentry for maintaining the gate-to-body voltage approximately constant at the non-zero value".

On page 4 of the Office Action in apparent reference to one or both of Claims 18 and 72, the Examiner alleges that "Applicant argues, in response to the examiner's argument that a component for maintaining the gate body voltage constant is inherent in Litwin invention, as discussed above, since it is true that the gate-to-body voltage is held constant (in the reference; at least in one of the operational mode), it is also true that a component for holding the voltage constant is in the reference" and follows this allegation with the comment that "Note that all the voltages applied to the device are inevitably from some voltage source". As pointed out above, the potential between source 13 and well 12 is not maintained approximately constant at a non-zero value in any of Litwin's six possible operational modes. Litwin thus fails to meet the componentry limitation of each of Claims 18 and 72.

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Independent Claim 63, along with dependent Claims 53 and 61, each recite (a) that a surface depletion region of the body region extends along the dielectric layer below the gate electrode and is spaced apart from a body contact portion of the body region and (b) that the

body contact portion contacts the body electrode and is more heavily doped than the surface depletion region.

On page 4 of the Office Action in apparent reference to one or more of Claims 53, 61, and 63, the Examiner states that "Regarding applicant's argument that the depletion layer in Lit win's device would not be more lightly doped than the well, Litwin discloses at column 5, lines 35-40, that the well region is more lightly doped at the surface".

Litwin specifies at col. 5, lines 36 - 40, that "A high dynamic range of the varactor is achieved by making the well region as lightly doped as possible at the principle [sic, principal] surface region by, for example, blocking the threshold implantation of the CMOS process". Applicant's Attorney sees <u>no</u> relevance of this feature of Litwin's well region to the body contact portion limitation of any of Claims 53, 61, and 63.

The fact that Litwin's well is more lightly doped at the principal surface, i.e., the upper semiconductor surface, does <u>not</u> disclose or in any way suggest the limitation of each of Claims 53, 61, and 63 that the body contact portion of the body region contact the body electrode, be spaced apart from the surface depletion region, and be more heavily doped than the surface depletion region. Independent Claim 63 is patentable over Litwin. The body contact portion limitation of each of dependent Claims 53 and 61 establishes a separate ground for allowing Claims 53 and 61 over Litwin.

Independent Claims 23, 71, and 79 each recite that the plate-to-body voltage is varied during operation of the varactor to cause an inversion layer that meets the plate region to selectively appear and disappear in the body region below the gate electrode. Independent Claim 38 similarly recites that an inversion layer which meets the plate region selectively appears and disappears in the body region below the gate electrode as the plate-to-body voltage is varied.

On page 4 of the Office Action in apparent reference to one or more of Claims 23, 38, 71, and 79, the Examiner states that:

> In response to applicant's argument that an inversion layer adds structural limitation to the claim, although the Office does not agree with this statement, an inversion layer would be created in Litwin's invention when a voltage is applied to the gate, and the inversion layer would vary in physical appearance by varying the gate voltage. Again, applying a voltage to a device, although it might change conductivity type in some region of the device, does not add any structural limitation to the device. Applying a voltage to a device

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is not a process-forming step either, rather is a method of using the device" is not understood.

The Examiner's statement that an inversion layer would be produced in Litwin's invention is totally and absolutely incorrect.

A core feature of the varactors of the present invention is that an inversion layer which meets the plate region selectively appears and disappears in the body region below the gate electrode as plate-to-body voltage V_R is varied. The capacitance of each of the present varactors undergoes an abrupt change in value as the inversion layer appears and disappears. See pages 15 - 29 of the specification. Especially see pages 22 - 24 where it is pointed out that the capacitance of the present varactors switches between high value C_{VAH} given by Eq. 17 and low value C_{VAL} given by Eq. 18 as plate-to-body voltage V_R passes through transition value V_X at which the inversion layer fully disappears.

The abrupt change in varactor capacitance as the inversion layer appears and disappears is acceptable in some applications of the present invention. However, the abrupt varactor capacitance change is highly undesirable in other applications. Accordingly, a substantial portion of the present application deals with techniques for controlling plate-to-body voltage V_R and gate-to-body voltage V_{GB} in such a way as to make the varactor capacitance change more gradually as the inversion layer appears and disappears. See pages 29 - 41 and 55 - 57 of the specification.

Nowhere does Litwin mention operating any of its varactors so that an inversion layer appears and disappears in the well below the gate electrode as potentials applied to the varactor are varied. If Litwin did intend to operate any of its varactors in a mode where an inversion layer selectively appears and disappears, the varactor capacitance would undergo an abrupt change in value as the inversion layer appears and disappears. Such an abrupt capacitance change would have been so important to the operation of Litwin's varactor that Litwin would necessarily have mentioned the abrupt capacitance change and the reasons for the capacitance change, i.e., the appearance and disappearance of the inversion layer, in Litwin's application.

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The fact that Litwin does not mention either an abrupt varactor capacitance change or an inversion layer shows clearly and absolutely to a person skilled in the art that Litwin does not contemplate operating any of its varactors so that an inversion layer appears and

disappears in the well below the gate electrode. Use of an inversion layer is not inherent to any of Litwin's varactors in any of Litwin's operational modes.

Nothing in Litwin would provide a person skilled in the art with any reason for modifying any of Litwin's varactors to operate in a mode where an inversion layer selectively appears and disappears in the well below the gate electrode. The inversion layer limitation in each of Claims 23, 38, and 79 makes them patentable over Litwin. The inversion layer limitation in Claim 71 establishes separate grounds for allowing it over Litwin.

In regard to the Examiner's allegation that an inversion layer does not provide a structural limitation, semiconductor regions of n-type and p-type conductivity are well recognized as providing structural limitations in U.S. patent claims. An inversion layer is a surface-adjoining region in which either negative or positive charge carriers (electrons or holes) are attracted to the surface to invert the region's conductivity type from original p-type to n-type or from original n-type to p-type. An inversion layer therefore has the conductivity-type characteristics which characterize a semiconductor region provided with semiconductor dopant to produce n-type or p-type material. Since n-type and p-type semiconductor regions provide structural limitations, an inversion layer also provides a structural limitation.

As to Claims 71 and 79, they are method claims and thus do not require structural limitations. An inversion layer changes the characteristics of the inverted portion of a semiconductor body. Nothing more than such a change is needed to establish a limitation for a method claim. Repeating what was stated in the June 2003 Response, weight in assessing patentability must be given to the inversion layer limitation of each of Claims 71 and 79 regardless of the Examiner's view on whether an inversion layer furnishes a structural limitation or not.

The relevance of the Examiner's comment that "Applying a voltage to a device is not a process-forming step either, rather is a method of using the device" is not understood. Methods directed toward fabricating and operating or using devices are all valid subject matters of method claims in U.S. patent practice. It is not a ground for rejecting a U.S. patent claim that the claim is directed toward, or includes a step directed to, the operation or use of a device.

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The net result is that nothing in the Examiner's response to the arguments presented in the June 2003 Response shows that any of Claims 23, 38, 71, and 79 is unpatentable in view of Litwin. Subject to the revision of Claim 71 to recite that the gate-to-body voltage is maintained approximately constant at a non-zero value, Claims 23, 38, 71, and 79 remain patentable over Litwin for the reasons given in the December 2002 Amendment and June 2003 Response. The same applies to dependent Claims 24 - 31, 39 - 46, 55 - 62, 72 - 78, and 80 - 88.

Independent Claim 32 requires that the plate region comprise a main plate portion and a plurality of finger portions that extend laterally away from the main plate portion such that at least two of the finger portions extend longitudinally <u>non-parallel</u> to one another. Dependent Claims 38 likewise requires that at least two of the finger portions be longitudinally non-parallel.

On page 4 of the Office Action in apparent reference to Claim 32 and/or Claim 68, the Examiner alleges that "In response to applicant's argument that the electrode fingers of the Japanese reference", presumably Misu, "are parallel to each other, a close examination of the figures in that reference shows that the electrode fingers are not parallel to each other". The Examiner has <u>not</u> identified the Misu material which allegedly discloses the non-parallel electrode fingers. Applicant's Attorney <u>cannot</u> locate any non-parallel electrode fingers in Misu.

More particularly, Applicant's Attorney pointed out in the June 2003 Response that Misu's Purpose section does not appear to disclose longitudinally non-parallel fingers. Applicant's Attorney then stated on page 27 of the June 2003 Response that:

> Figs. 1, 13, 15, 17, 19, 23 - 25, 36, 43, and 45 - 48 of Misu all appear to disclose structures having electrode fingers of varying widths. The longitudinal axes of these electrode fingers are, however, all <u>substantially parallel</u> to one another [Footnote: A longitudinal axis of an elongated object is a straight line that goes in the direction of the object's length.]. None of Figs. 1, 13, 15, 17, 19, 23 - 25, 36, 43, and 45 - 48 appears to disclose longitudinally non-parallel fingers.
>
> Applicant's Attorney is unable to determine what is shown in Misu's Figs. 7 and 9 cited by the Examiner. Figs. 7 and 9 do show dark regions that may be the ends of electrode fingers where they are interdigitated. To the extent that Applicant's Attorney has correctly interpreted Figs. 7 and 9, the longitudinal axes of these finger-shaped regions all extend <u>substantially parallel</u> to one another. As far as Applicant's Attorney can determine, Misu

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does not disclose longitudinally non-parallel fingers in Figs. 7 and 9, in the Purpose Section, or anywhere else.

In short, the Examiner's vague allegation that Misu discloses non-parallel electrode fingers appears to be inaccurate. If the Examiner continues with this allegation, the Examiner should particularly point out where Misu is believed to disclose such non-parallel electrode fingers in order to comply with the 37 CFR 1.104(c)(2) requirement that "When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on" by the Examiner "must be designated as nearly as practicable". Absent such clarification, the rejection of Claims 32 and 68 based on Litwin and Misu is unsupported.

Applicant's Attorney further pointed out on page 27 of the June 2003 response that there would be no reason for applying Misu to Litwin even if Misu did disclose longitudinally non-parallel electrode fingers. Applicant's Attorney specifically stated that:

> Secondly, the fingers in Claims 32 and 68 are parts of the plate region and thus consist of semiconductor material. In contrast, the fingers disclosed in Misu are electrode fingers and thus presumably consist largely of metal. Hence, the fingers in Claims 32 and 68 are constituted quite differently than Misu's fingers.
>
> Thirdly, nothing in Litwin indicates that any gain would be made by modifying Litwin's parallel semiconductor fingers 83, 84, and 91 to be longitudinally non-parallel. Even if Misu does, in fact, disclose longitudinally non-parallel fingers somewhere, there would be no reason for applying the teachings of Misu to Litwin. In this regard, Litwin's fingers are differently constituted than Misu's fingers. As occurs with the semiconductor fingers of Claims 32 and 68, Litwin's fingers consist of semiconductor material whereas Misu's fingers appear to consist largely of metal.
>
> Note that providing the plate region in the varactor of the present invention with longitudinally non-parallel fingers improves the quality factor. See paragraph 262, page 71, of the present application. Nothing in Litwin suggests that using longitudinally non-parallel fingers would improve the quality factor. To the extent the Misu does disclose longitudinally non-parallel fingers, Misu is irrelevant to the patentability of Claims 32 and 68.

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Similar to what was stated above about Claims 23, 38, 71, and 79, nothing in the Examiner's response to the arguments presented in the June 2003 response shows that Claim 32 or 68 is unpatentable based on Litwin taken with Misu. Claims 32 and 68 are thus patentable over Litwin and Misu for the reasons given in the June 2003 Response. In fact,

since Misu is immaterial to Claims 32 and 68, these two claims are patentable over Litwin and Misu for the same reasons, as presented in the December 2002 Amendment, that Claims 32 and 68 are patentable over Litwin. The same applies to dependent Claims 33 - 37 and 70.

In summary, all of pending Claims 17 - 88 are patentable over the applied art. Accordingly, Claims 17 - 88 should be allowed so that the application may proceed to issue.

Please telephone Attorney for Applicant(s) at 650-964-9767 if there are any questions.

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